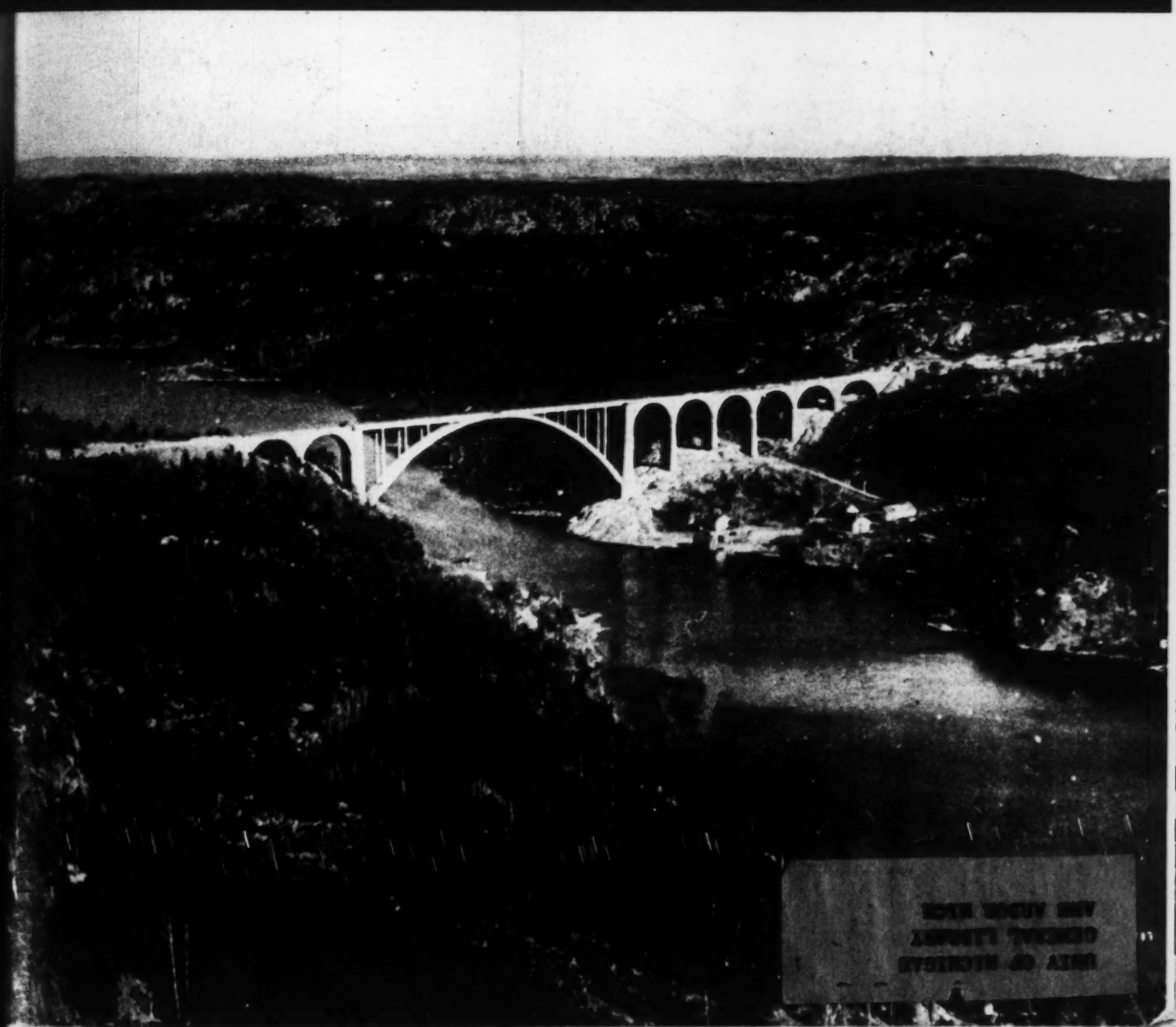
ENGINEERING NEWS-RECORD

mpleted after a 4-year delay the concrete-arch Svinesund Bridge connects Norway and Sweden



GENERAL ELECTRIC

Announces . . .

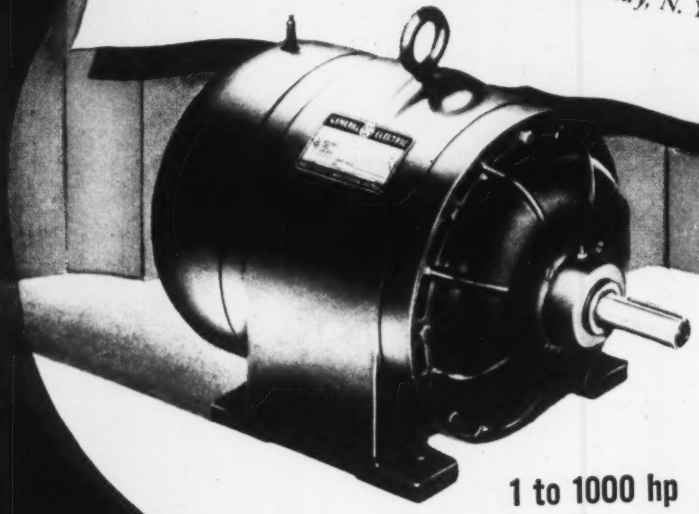
NEW

Totally Enclosed TRI-CLAD MOTORS

In 1940, G.E. introduced the Tri-Clad open motor—with emphasis on the feature that industry wanted most in a motor, *protection*. Since then, more Tri-Clads have gone into service than any other integral-horsepower motor.

Today, we are ready with a new line of Tri-Clad motors—*totally enclosed, fan-cooled motors*—built on Tri-Clad design principles in both standard and explosion-proof types.

We believe that these are industry's most dependable motors. They are designed specifically for use in many adverse atmospheres—in iron dust, outdoors, in hazardous areas, and chemical atmospheres. Their scope of application is as wide as the field of industrial motor use. Safe-guarded against most sources of motor damage, their longer life and lower maintenance will make them economical motors for use on almost every job. *General Electric Company, Schenectady, N. Y.*



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COMPLETE ENCLOSURE FOR PROTECTION AGAINST DIRT, DUST, AND WEATHER

News of the Week

ENGINEERING NEWS-RECORD • MAY 23, 1946 • VOLUME 136 • NUMBER 21

Private building levels off at $80 million weekly rate

News-Record figures show steady rate of contracts let since CPA curtailment order was issued—Manufacturers, stores and others list extensive plans

The effect of the issuance of the Civilian Production Administration's order (*ENR* March 28, vol. p. 441) tightening restrictions on new construction other than housing has been to level off private engineering construction at least temporarily to a pace of about $80,000,000 per week, *Engineering News-Record's* business news department reported last week.

In spite of the stabilization of the rate at which contracts have been let, the figure is substantially above that of the corresponding months of 1945.

For the week of March 28, *ENR* reported private building contracts let totalling about $101,000,000. By the week of April 4, this figure had fallen to $80,000,000, and with one exception—the week of April 18, when $105,000,000 was recorded—has since remained at approximately that figure. Broken down further, the figures show an average weekly rate of about $60,000,000 for commercial construction—which includes housing—and an average of about $18,000,000 per week for purely industrial work.

Although the rate in commercial buildings apparently has stabilized since the order was issued, it still represents a jump of about 50 percent over the rate reported in the weeks immediately preceding the issuance of the CPA order.

Many new plans announced

Meanwhile, despite uncertainties, shortages of some materials and other factors, manufacturers in many parts of the country continued to report progress in their construction plans. Some of the jobs reported last week included:

The Lindsay Corp. is building a new 1-story plant and a 2-story office on a 7½-acre tract in Melrose Park, Chicago suburb. Construction started in February and is now nearing completion. The plant is for production of truck and trailer bodies, lockers, housings for industrial machinery and equipment, as well as for prefabricated houses.

The Austin Co. is designing a new plant and general office building for the William J. Strange Co. in Maywood, a western suburb of Chicago, to cost more than $500,000. Approximately 100,000 sq. ft. of floor space will be provided for the manufacture of seasonings and antioxidant. Glazed tile will be used extensively throughout the interior.

$2 million glass plant

The Pittsburgh Corning Corp. has announced plans to build two plants on a 40-acre site at Sedalia, Mo. for the production of glass block and a cellular glass insulating material. The estimated cost of the expansion program is $2,000,000. The Sedalia plant will be similar to the company's facilities in operation at Port Allegany, Pa.

Olds, Wortman & King department store in Portland, Ore. is undertaking a $1,000,000 expansion and remodeling program to extend over five years. Installation of escalators—said to be the first since start of the war and the first in the Pacific Northwest since 1938—is under way in the 3-story, block-square structure. Plans include addition of one or more floors, modernization of the elevator system, reconstruction of entrances and exterior and extensive remodeling of second-floor departments

Washington Securities Co., Seattle, Wash., is constructing an 8-story addition to its present building, to cost $750,000. It is planned as a future 20-story office structure and the firm will make further enlargements costing $5,000,000 when building materials are more available.

Many other projects

Recent approval by CPA for industrial building projects at Los Angeles, Calif., includes $685,000 worth of improvements at the Standard Oil Co. of California refinery at El Segundo, an incinerator for the city of Los Angeles, costing $587,600; Mitchell Manufacturing Co., con-

(*Continued on page 6*)

Army starts planning 8 VA hospitals

Army Engineers will start work immediately on plans and specifications for eight hospitals for the Veterans Administration, according to Lieut. Gen. Raymond A. Wheeler. At the same time they will start work on a field survey for a $10,423,000 new 1,000-bed hospital at Albany, N. Y., and for additions or conversions at five other hospitals.

The location, size, type and estimated cost of the eight general medical hospitals for which plans are authorized, include the following units: (the Albany hospital being in addition)

Iron Mountain, Mich., 250-bed, $2,555,037; Seattle, Wash., 300-bed, $3,351,216; Wilkes Barre, Pa., 475-bed, $3,703,463; Decatur, Ill., 250-bed, $2,768,258; Shreveport, La., 450-bed, $3,715,361; Big Spring, Tex., 250-bed, $2,570,753; Miles City, Mont., 100-bed, $1,052,312; Fresno, Calif., 250-bed, $2,634,676.

The Veterans Administration early in May requested the Corps of Engineers, who are assisting the VA in its vast hospital construction program, to develop plans and specifications, preparatory to calling for bids for construction, on a 750-bed general medical and surgical Hospital to be built at Louisville, Ky.

This project is the thirteenth veterans hospital turned over to the Engineers by the VA for the development of complete plans and specifications. The estimated cost of the project is about $4,500,000.

For a list of the other hospital projects turned over to the Army Engineers see *ENR* Feb. 21, vol. p. 265, and April 18, vol. p. 531.

NEWS IN BRIEF

In telegraphic form, here are latest news developments on the engineering and construction front during the week.

Construction—To finance a program to provide living accommodations for many homeless persons, *Atlanta, Ga.*, voters will be asked to approve a $40,000,000 improvement bond issue in June. . . . *Minnesota* school authorities reported their $27,000,000 building program will be cut drastically by costs running 75 percent higher than pre-war. . . . *St. Louis, Mo.*, announced it would do "little" construction work although it has funds through recently approved bond issues because of costs, shortage of labor and materials. . . . The *Washington* State Development Board will immediately allot $20,000,000 to cities and counties for needed construction. . . . A $2,497,000 contract was awarded last week for construction of eight piers for the *Astoria, Ore.*, naval basin. . . . *Los Angeles, Calif.*, plans to spend $15,558,000 for harbor improvements. . . . *Alabama* planned a $1,600,000 office building at Montgomery.

Highways—*Oklahoma* will have an additional $10,000,000 to spend on highways July 1, when surplus from the state general revenue fund becomes available. . . . *Alabama* has let final contracts for its initial $3,520,000 roadbuilding program. . . . *Connecticut* will spend $900,000 for new motorized equipment. . . . *Mississippi* legislators outlined a $50,000,000 highway building program. . . . *Pennsylvania* awarded contracts totalling $2,645,000 on projects including four bridges and 30 miles of road. . . . *South Carolina* will spend $5,800,000 immediately on rural road paving work. . . . Despite refusal of the federal government to contribute further funds, *Pennsylvania* will continue work on U. S. 40 improvements, to cost about $1,500,000. . . . *North Carolina* announced it had some 1,600 miles of county roads under contract for improvement or construction. . . . *Kansas* ascribed the slowness of its 1,200-mile rural road program to lack of qualified engineers. . . . *Colorado* announced a plan to speed road construction by segregating its contracts into high and low altitude work, to permit lower bids during favorable building seasons. . . . The *Missouri* State Highway Commission and the Federal Bureau of Roads have approved plans for a $9,000,000 six-lane expressway around the outer borders of *St. Louis*. . . . Contracts totalling $16,732,711 have been let to date in connection with *North Carolina's* $100,000,000 postwar highway construction program—including improvement of 1,362 miles of rural roads.

Waterworks and Sewerage—Voters of *Glendale, Calif.*, approved a $1,000,000 appropriation for construction of outfall sewers and disposal facilities. . . . Foundation work for a new garbage incinerator for *Houston, Texas*, to cost $332,893, are well advanced. . . . The *Los Angeles, Calif.*, city council voted approval of a plan whereby the city and 21 surrounding municipalities will share cost of construction of the new Hyperion sewage disposal plant. . . . Thirty-one *Oregon* cities are planning sewerage projects estimated to cost $5,242,500. . . . Revamping of the *Lockport, N. Y.*, water system is under consideration by the city council. . . . *Delavan, Ill.*, voters approved a $130,000 bond issue for water system improvements. . . . *Sparta, Tenn.*, will build new water supply facilities to cost $125,000.

Bond Issues—*Charleston County, S. C.*, will vote soon on a $1,000,000 issue for road improvements. . . . Numerous *Ohio* cities voted May 7 on bond issues for local improvements, including a $14,000,000 program for *Cuyahoga County* schools. . . . *Alton, Ill.*, approved a $450,000 issue for new high school. . . . The *Minneapolis, Minn.*, Park Board asked approval of a $545,000 issue for purchase of new land for park development.

Penna. Turnpike tolls total $12,600,000

The Pennsylvania Turnpike Commission has reported that revenues from the superhighway totaled more than $12,600,000 since it was opened Oct. 1, 1940.

More than 8,265,000 vehicles traveling the $70,000,000 express highway paid tolls amounting to approximately $11,850,000. In addition, the commission collected about $750,000 in rentals from restaurants, service stations and concession stands.

Baird Snyder dies, was aide to FWA chief

Baird Snyder 3d, 46, Assistant Federal Works Administrator, died May 18 at his home in West Moreland Hills, Md.

A native of Lansford, Pa., he attended Cornell and Yale Universities and Massachusetts Institute of Technology before beginning his career as an engineer. He joined the government service in 1935 as Resettlement Administration Engineer and in most of the years since then has been closely associated with Maj. Gen. Philip B. Fleming, the present Federal Works Administrator.

"He held engineering and administrative posts with the resettlement administration, the farm security administration, and the department of labor, and became director of FWA's war public works program in 1941."

Calendar of Meetings

NATIONAL

International City Managers' Association, annual meeting, Montreal, Canada, June 16-21.

Society for the Promotion of Engineering Education, annual convention, Jefferson Hotel, St. Louis, Mo., June 22.

American Society for Testing Materials, 49th annual meeting, Hotel Statler, Buffalo, N. Y., June 24-28.

Society for Experimental Stress Analysis, spring meeting, Hotel Statler, Buffalo, N. Y., June 24-26.

Associated General Contractors of America. Washington, D. C. Spring governing and advisory board meeting, Shirley-Savoy hotel, Denver, Colo., June 29-July 2.

REGIONAL

New York State Sewage Works Association, spring meeting, Hotel Hamilton, Utica, N. Y., May 24-25.

North Carolina Society of Engineers, annual summer convention, Wrightsville Beach, N. C., June 7-8.

Third Hydraulics Conference, State University of Iowa, Iowa City, Iowa, June 10-12.

California Sewage Works Association, 1946 convention, Monterey, Calif., June 9-11.

North Carolina Waterworks Operators' Association, annual operators' training school, Chapel Hill, N. C., June 10-15.

Ohio Conference on Sewage Treatment, Mayflower Hotel, Akron, Ohio, June 20-21.

New Jersey Section, American Water Works Association, summer meeting, Little Falls, N. J., June 28.

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Housing program moves ahead despite lack of definite federal legislation

Wyatt asks planning cooperation, while other agencies tell of some progress—Other activities in program reported

Generating considerable momentum—although not so much definite progress pending final congressional action on a variety of housing measures—the federal emergency housing program last week continued to be a major center of interest for the United States.

Heads of federal agencies called on planning authorities to cooperate in obtaining best results from the program; offered a series of suggested small homes layouts, and announced a study of city zoning laws. Meanwhile, local units went ahead with their plans as best they could.

In a paper prepared for the American Society of Planning Officials, Wilson W. Wyatt, Housing Expediter, said that city planning consists of more than "pretty pictures without the necessary understructure of concrete plans," and urged planners to consider their cities and their surrounding metropolitan areas as a whole rather than as individual parts.

At the same time the National Housing Agency announced that in order to "encourage lower prices, improve quality and speed start of housing construction," the Federal Housing Administration has offered the public a series of suggested small-home layouts for general guidance and use. Raymond M. Foley, FHA Commissioner, said that the plans embody FHA's minimum planning standards and are offered as suggestions subject to varying conditions in local markets and to individual preferences. Estimates of construction costs are not given, as these differ widely throughout the country. The plans made available are in six basic layouts, five for 1-story detached buildings, and one for a 2-story row dwelling.

The Construction Division of the Department of Commerce has started a study of all building codes now in force in the United States, hoping that through this work more definite information will be obtained on code revision needs. To date, the Commerce Department's progress along the line has been slow because only a few structural engineers or widely experienced specification writers have applied for positions with the Construction Division. The division said it would take additional applications for the work through John Haynes, head of the Construction Division, at Room 3077, Department of Commerce Building, Washington 25, D. C.

Mr. Wyatt announced also that, in a joint move with the Department of Agriculture, he had taken steps to insure a boost of more than a billion board feet in lumber production during 1946-47. The steps taken included: Authorization for construction of access roads to reach out-of-the-way government timber stands, and agreement by the U. S. Forest Service to permit for an emergency period "overcutting" of timber beyond normal yields in the South and West.

And, acting to implement the Veterans Emergency Housing Act's subsidy provision, Wyatt said he had already called industrial consultants to Washington to work out a subsidy program.

Warns of shoddy construction

A warning that the present housing demand may create a dangerous trend toward flimsy housing was voiced by Edward H. Walker, vice president of the Anthracite Institute, speaking before the National Fuel Credit Association at St. Louis last week.

"If the trend is toward the cheapest type of housing," Mr. Walker said, "we are merely building the slums of tomorrow. The country cannot afford insufficient housing or poor construction, and every industry involved in housing must cooperate toward reducing the cost of establishing a home. The total effect of such an industry move would be to widen the housing market and all related markets."

Meanwhile the Federal Public Housing Authority announced that a total of 167,901 units of temporary emergency housing for veterans' and servicemen's families has been allocated as of May 3 to municipalities and educational institutions. The temporary housing is approved by FPHA under Title V of the Lanham Act, which authorizes dismantling and moving about 200,000 units of surplus war housing facilities and converting them into emergency housing.

In addition, FHA announced that applications for priorities involving 400,000 new dwelling units had been approved by it between January 15 and April 26 of this year. The total includes applications to construct 350,000 new homes, 50,000 conversions and about 9,000 applications for repair and alteration jobs.

Increase in roofing products

Moving to eliminate shortages, the Office of Price Administration said that it had approved an average increase of 7½ percent over existing manufacturer

(*Continued on p. 6*)

Cutting costs gets contractor into trouble

Morris Bluestone, Canton and Massillon, Ohio, home builder, charged by the Wage Stabilization Board with paying workmen illegal (too high) wages in constructing homes for vets, told a panel hearing the case in Cleveland how he trimmed construction costs so that he was able to sell 5-room homes with an OPA ceiling price of $7,250 for $5,850 and make money. Bluestone also informed the panel that if wage controls were removed, he would be able to reduce the price at least another 20 per cent.

Admitting that he paid higher rates than the established wage scale, the defendant claimed that by using only top men, his total labor cost per house was less than if run-of-the-mine building tradesmen were used.

By using best men obtainable, together with labor-saving equipment, Bluestone eliminated all sub-contractors. By such methods, he told the panel, cost of excavating dropped from $75 to $14, by hiring his own superintendent and masons the brickwork cost dropped from $325 to $130; sewer-digging and pipe-laying costs were reduced a matter of $100 when done by his own men, and where cement basement floors and steps formerly cost as much as $220 per house, under his own supervising, the work was done for $90.

Rough-in carpentry costs were reduced from $300 per house to $120 by the elimination of sub-contractors and by organizing the carpenters into teams, plumbing costs under his own master plumber averaged $350 per house where, under sub-contracting, the cost had soared to $650. Painting came in for a reduction of $250 and electrical work was cut from $140 to an average $60 under his own plan of supervision. One of the big savings came in grading costs which were reduced from $200 to an average $20 per unit.

Bluestone, using his own methods of construction and employment of labor, and without interference, completed 45 houses in March.

Four days had been devoted to hearing testimony up to May 15 when the hearing was adjourned until May 20 when several of Bluestone's irate competitors are expected to take the stand against the individualistic builder.

DEVELOPMENTS BEYOND U. S. BORDERS

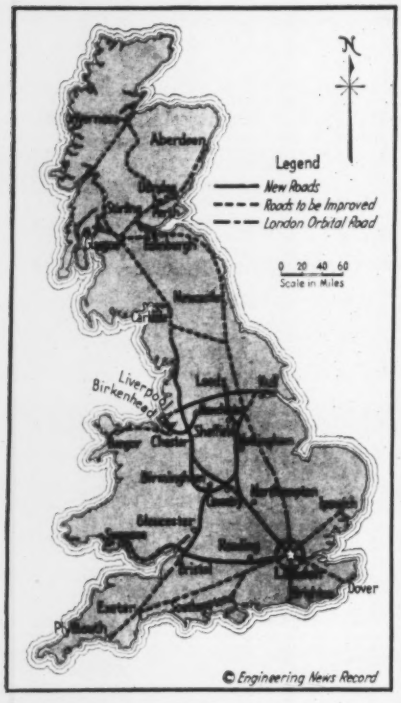
Digested from reports by Engineering News-Record correspondents and the McGraw-Hill World News Bureau

British plan $400,000,000 road program to include key interregional routes—Venezuelan companies to build road for government use

England—The British government plans to spend up to $400,000,000 in its first year of postwar roadbuilding, the British minister of transport told members of Parliament recently.

The program outlined by the transportation ministry includes a great deal of reconstruction and rehabilitation of roadways badly damaged by heavy war use, and, over a ten year period, it envisages a network of "national routes" that would tie England, Scotland and Wales in a national road network.

According to the government's plan, work in the first five years will be concentrated on reconstruction and repair, plus attention to relocation and improvement of hazardous locations as indicated by studies of continuing traffic and accident surveys.



England's postwar reconstruction program includes an elaborate plan for interregional highways that will tie the "tight little isle" with first class motor roads.

The second stage of the program will be devoted to the "national routes" and integrating existing major highways with the proposed system.

It was said the plan is "sufficiently flexible" to accommodate itself to possible future changes in government.

Venezuela—A new wrinkle in highway-building is scheduled in Venezuela, where eleven oil companies have banded together to construct a 200-mile $9,000,000 road through the states of Guarico and Anzoategui. The new highway will extend from El Sombrero in Guarico to the Port of Guanta, on the Caribbean and will be open for public use.

Principal object of the road is to carry materials for the exploration work now going on in new concessions located in Guarico and Anzoategui, although it will be a public highway. Entire cost of the project is being borne by the oil companies in exchange for certain concessions in those states. The Creole Petroleum Corporation (Standard) is in charge of the work, under supervision of a committee composed of five representatives of the other companies.

In addition to the principal roadway, several lateral branches are included in the plan. The new road will be the first to unite Guanta, Puerto La Cruz and Barcelona directly with Caracas, capital city, and thus automatically become a link in the Pan American highway.

The cost of the highway will be divided by the companies operating concessions in Guarico and Anzoategui, according to the size of the areas they are exploring. The companies are: Petrolera Las Mercedes (Texas), Creole Petroleum Corp., Venezuelan Oil and Transport Co., Venezuelan Atlantic Refining Co., Sinclair Oil Company, Caracas Petroleum Co., Socony Vacuum Oil Company of Venezuela, Mene Grande Oil Co., Pantepec Oil Company of Venezuela, Phillips Venezuelan Oil Company, and Petroleum Investments Ltd.

It will permit rapid access to fertile regions of Venezuela which up to now have not been sufficiently developed because of the lack of year round communication.

Turkey—Beginning with $600,000 worth of road-building equipment to be bought this year in the U. S., the Turkish Ministry of Public Works has a grand twenty-year plan for $1,250,000,000 worth of new and reconstructed highways.

Two main phases of the plan are projected, each covering ten years. The first would concentrate on 16,000 miles of new or improved trunk roads to link the main ports of Istanbul, Smyrna, and Mersin with newly developing industrial centers in the country's interior. The second phase, ending in 1965, comprises a further 80,000 miles, including about 50,000 miles of reconstructed secondary routes.

American engineers and equipment are favored by the Turkish Highways Mission, largely because of excellent impressions the mission gained of our equipment on a recent visit to the U. S. The mission recommends use of U. S. engineers to prepare the blueprints for the program, and suggests placing contracts with U. S. firms for the more difficult and the more heavily travelled sections, about 40% of the total.

Much of the proposed work will depend on granting of foreign credits.

Eleven oil companies operating in Venezuela plan construction of a 200-mile highway to connect oil-rich areas by road with Carribbean seaports at La Guaira and Guanta

Japan—An estimated 700 units of major construction equipment will be required for road building in Japan during 1946 and 1947, according to a recent report issued by the Supreme Commander for the Allied Powers.

France—The French program of highway bridge reconstruction is still proceeding in low gear, owing to lack of materials and the wide extent of destruction. In all, the war blasted nearly 6,000 bridges in the country, with a total length of about 110 kilometers.

At present those bridges considered most indispensable on important roads are being permanently rebuilt, as well as those requiring little material and those now maintained by temporary structures

considered unsafe. Eventually highway bridge reconstruction will probably take about 220,000 metric tons of steel, 650,000 tons of cement, and 300,000 cubic meters of wood.

India—Molasses, converted into a resinous binder with coal tar and asphalt, has been successfully used as a road surfacing material in India. The Indian government's ordnance laboratory has found that roads so surfaced have stood up satisfactorily under heavy traffic and were not washed out by the tropical rains.

Peru—The Peruvian Public Works Department has announced it will spend about $48,000,000 on highways during the next five years, with approximately 20 percent of the money to be spent abroad for materials and machinery. Most of the highway work will be devoted to improvement and maintenance, rather than new construction.

Housing . . . . .

Mexico—The Mexican Ministry of Finance is preparing a measure to impose a heavy tax on private urban building, in an effort to re-channel the building boom which has increased urban construction in this country by 300% since 1939.

In Mexico City alone nearly 10,000 buildings were completed last year, valued at $35,000,000, compared to 3,000 valued at $9,000,000 in 1939. The municipal government still contends, however, that the city needs at least 38,000 more new dwellings.

Another development is the arrival in Mexico of John Sloan, New York architect who designed the Mexico City race track, in connection with plans for building new baseball parks in key cities of the republic.

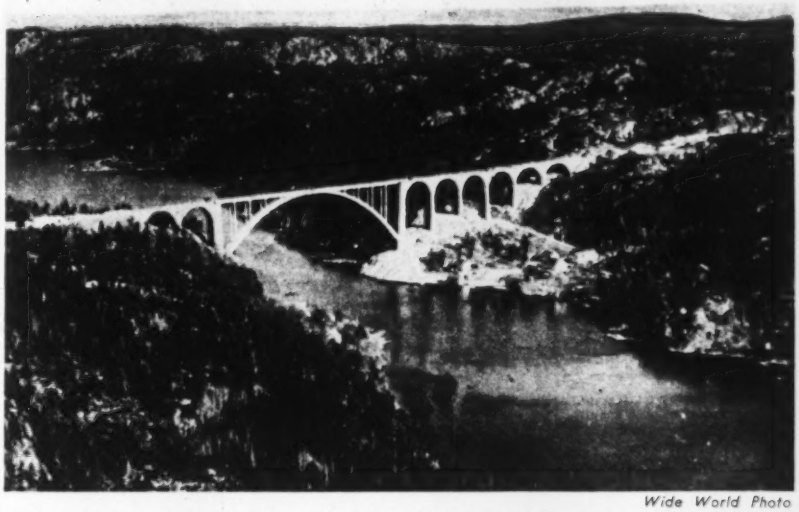
Venezuela—Final plans for the construction of a new $3,000,000 hospital in Caracas are expected to be issued shortly by the Venezuelan social security authorities. Construction bids have already been received from two companies.

Building Construction . . . . .

Brazil—Building permits issued in the city of Rio de Janeiro during 1945 totalled 2,068, up 25% from 1944 despite the war-created shortages of materials. The whole gain was concentrated in buildings of 3 floors or less, with fewer buildings of 10 floors or more being built than in the former year.

Chile—Excavations for what is claimed will be the largest building in Latin America were started recently in Santiago, Chile. The new building, an apartment house, will be 17 stories high, with two floors and a concourse below ground, and will cover 861,000 sq. ft., a whole city block. Constructed entirely of reinforced concrete, it is to cost about $8,000,000.

Only a few of the major contracts for building and supplies have been let.



Wide World Photo

***Delayed Opening**—On June 15, King Gustav V of Sweden and King Haakon of Norway will formally open the Svinesund Bridge over the Idefjord River on the main highway connecting the two countries near Oslo. Started and nearly completed just prior to the war, the concrete-arch structure is 570 ft. long in main span and its 23½ ft. roadway and two 4-ft. sidewalks are 270 ft. above the water. About 111,000 cu. ft. of concrete went into its construction. The original opening date had been set for early in 1942, was delayed by war.*

Transport . . . . .

India—The newly-elected Standing Finance Committee for Railways has approved the provision of $6,000,000 for the construction of new lines and the restoration of lines dismantled during the war, and $46,000,000 for work on the lines now in operation during 1946-47. The question of which lines are to be constructed and which dismantled lines are to be restored was left to the Railway Board.

China—The Central China Railroad Administration has drawn up plans for the construction of a new North Station in Shanghai. The six-story building, which will occupy a space 520 ft. by 60 ft. when completed, is expected to cost approximately $1,500,000 in U. S. currency.

Australia—Work will begin late this year on a seven-mile, $22,500,000 addition to the city subway system at Sidney. Cost of driving the tunnels through the sandstone peninsula on which the city stands is estimated at approximately $3,230,000 per mile. It is estimated that it will take seven years to complete the city's entire $242,250,000 subway project.

Meanwhile, establishment of a subway system in Melbourne, Australia's second largest city, is being advocated.

Switzerland—The city of Basel is holding a referendum on plans for a large new airport. When finally completed, the field would have three concrete runways, including one for blind landings, with varying lengths of 2200, 2000, and 1650 yards. A temporary port has recently been opened near the proposed site, using a 1300 yard runway made of metal landing strips salvaged from French military airfields.

The whole airport is to be a joint Swiss-French affair, since the site lies just over the border in France. Final cost would be $6,000,000, with the Swiss government paying 30% and the French donating the land.

Zurich also has a new airport in the planning stage. Four runways—2200, 1800, 1750, and 1550 yards—are projected, at an over-all cost (including land) of $16,000,000.

Puerto Rico—The Puerto Rican planning board has approved a master plan for the construction and maintenance of the island's highways, involving appropriations totalling $153,429,000 over a 25-40 year period. The insular legislature is to make necessary appropriations from year to year.

Housing program moves ahead

(*Continued from page 3*)

ceiling prices for asphalt and tarred roofing products in the eastern area of the United States. Recently granted increases in manufacturers' costs for dry felt, asphalt and labor and packaging rates were responsible for the latest action, which was effective May 10. Resellers may pass on the increase by the actual dollar-and-cent amounts.

Other national agency action during the week included the appointment of Capt. E. A. Verpillot, of New York City, as deputy expediter in charge of the office of production and supply of the National Housing Agency. Captain Verpillot will work closely with Rear Admiral Kirby Smith, general deputy expediter, and will have general charge of the production end of the Veterans Emergency Housing Program. Under his orders will be technical research, prefabrication production, construction, materials, and labor relations branches of the organization.

Warns of inflation

William H. Husband, general manager of the Federal Savings and Loan Insurance Corp.—a subsidiary of the Federal Home Loan Bank Administration—urged real estate and home financing interests to join hands "in an educational program to combat inflation in residential real estate."

"Desperate bidding for shelter has driven the prices of existing houses upward with little regard to durable values in many areas," Mr. Husband said. "All groups interested in construction, marketing and financing of homes could well take common action to place the general public on guard against the dangers inherent in the current market." He added that although the cost of living has risen about 28 percent since 1940, real estate prices have increased from 40 to 100 percent as a result of the record housing shortage, speculation and increased costs of construction.

Recently the National Association of Housing Officials reported many cities meeting the costs of emergency housing through private contributions, municipal loans and sponsorship by veterans' organizations.

In Omaha, Neb., an appeal to citizens for money to finance erection of 225 dwellings for veterans brought hundreds of small contributions totalling nearly $20,000. In San Francisco, the American Veterans' Committee plans to finance construction of 1,500 housing units, and Red Cross contributions of $60,000 are helping to provide emergency housing for Los Angeles veterans.

St. Louis, Mo., provided $19,000 from city reserve funds for purchase of a site on which to erect emergency housing units. In New York State $35,000,000 has been transferred from the reconstruction fund to aid local housing. Illinois and California recently made similar grants, in smaller amounts.

Other developments

At St. Louis, Mo., members of the AFL Carpenters and Joiners Union in the East St. Louis, Ill. approved construction of prefabricated houses in the area. Previously there had been an unofficials ban by union carpenters against the erection of such houses.

More than one-half million feet of lumber has been salvaged from the dismantling of 16 barrack buildings at Camp Callan, according to J. H. Shaw, purchasing agent for the city of San Diego, Calif. Purchase of the camp from the government was made early in April (*ENR*, April 4, vol. p. 460). Mr. Shaw said that the city already has sold 20 one-story buildings to veterans, at prices of from $500 to $1,000 for each of the buildings. Three of the camp chapels have been sold to church congregations, while the entire electrical transmission and distribution system were sold to the San Diego Gas & Electric Co.

***For Atom Test**—Drawing on their wartime experience in speedy construction, 1,000 Seabees are transforming Bikini Atoll in the Marshall Group into a laboratory to record effects of atomic bomb attacks on a fleet of naval vessels. Here a 60-ft. naval navigation tower goes up to aid airmen and surface observers obtain precise recordings of the test.*

Urge $9,000,000 works program for Tennessee

A long-range public works program estimated to cost $9,000,000 has been outlined by the Tennessee State Planning commission, which has just presented to the governor a 210-page report.

According to this report, the state has a vast amount of "deferred maintenance", which should be taken care of soon.

Besides a detailed list of the needs of state educational, charitable, and penal institutions, the commission recommends that fish hatcheries, fish-holding pools, and stream improvements for the Department of Conservation and Division of Game and Fish be carried out. Listed also are certain public works projects that the commission considers sufficiently urgent to be undertaken within the next 18 months.

Building levels off at $80 million weekly

(*Continued from page 1*)

struction of a $187,242 factory; Rheem Manufacturing Co., enlargement of its plant, $106,987; and Floor Coverings, Inc., new $105,000 plant.

Rock Hill, S. C.—The Celanese Corp. of America has added $5,000,000 to the previously authorized $10,000,000 construction cost of a manufacturing plant at Rock Hill, S. C.

Harleyville, S. C.—Work is under way on the first unit of a $2,000,000 cement plant for the Carolinas Cement and Lime Co.

Seneca, S. C.—A building program costing $1,500,000 and expected to be completed within four months has been approved for the Utica and Mohawk Mills plant at Seneca, S. C., according to Director R. M. Cooper of the S. C. Research, Planning and Development Board.

Long Beach, Calif.—Hundreds of heavy foundation piles have been driven for the wall-board plant of Henry J. Kaiser's Standard Gypsum Co. of California. The new mill will make gypsum lath and wall-board and exterior sheathing.

Oklahoma—Commercial construction projects in this state totaling some $3,132,172, have been approved according to CPA district manager Merwin T. Buxton.

The largest of the projects is the $650,000 Medical-Rental Center to be erected in Oklahoma City by Robert H. Adams. Another Oklahoma City hospital project likewise received approval. The Wesley Hospital requested and received approval of a $310,000 program to complete the east wing of the hospital.

Rochester, N. Y., drops jobs in labor dispute

Total of 489 jobs abolished by city—Strike halts N. J. housing project—Other developments reported

On account of continued efforts to organize municipal employees, City Manager Louis B. Cartwright of Rochester, N. Y., on May 15 abolished 489 department of public works jobs and ordered the work to be done by private contract. Mr. Cartwright made this statement:

"It has become apparent that a number of city employees are determined to persist in tactics that are not in the best interest of city services.

"Because such tactics would lead to a dangerous crippling of services vital to public health, safety and welfare, it becomes necessary for this administration to take immediate and very positive steps to protect the public's interest."

On May 21, the jobs were restored by Mr. Cartright "so that the men who were deprived of jobs could return to work for the city as individuals".

Strike stops N. J. housing

Work on at least six major housing development projects for veterans in Essex and western Hudson Counties, N. J., was halted May 15 by a strike of 2,800 carpenters, members of eight locals comprising the Essex County Council of Carpenters, AFL. The strike resulted from the refusal of the Wage Adjustment Board to reconsider the council's appeal from a decision granting a 10-cent an hour increase over the $2 an hour wage rate. The council had asked an increase of 30 cents an hour.

Wage increases in Northwest

Wage increases ranging from 12½ to 20 cents an hour have been approved by the Wage Adjustment Board for equipment operators and truck drivers working on heavy construction projects in Oregon and the five southwestern Washington counties.

New York seeks labor aid

New York State has invited representatives of organized labor to sit in on a series of conferences between state officials and contractors aimed at removal of barriers to the state's vast building programs.

Charles H. Sells, state superintendent of public works, said a meeting will be held early in June in which labor representatives will be asked to participate. Problems—such as state rules that prohibit construction workers from working more than eight hours per day, despite the fact that their employment is seasonal—will be discussed.

Plan an organization of Seabee reserve officers

Civil Engineer Corps officers who directed the Navy Seabees in their advance base construction program are being invited to join a voluntary reserve organization to keep them abreast of developments in military engineering.

The Navy's Bureau of Yards and Docks, in conjunction with the Bureau of Naval Personnel, has launched the new organization with a view to building an active interest in naval shore construction by the approximately 10,000 Civil Engineer Corps Reserve officers who served tours of active duty with the Navy during the war.

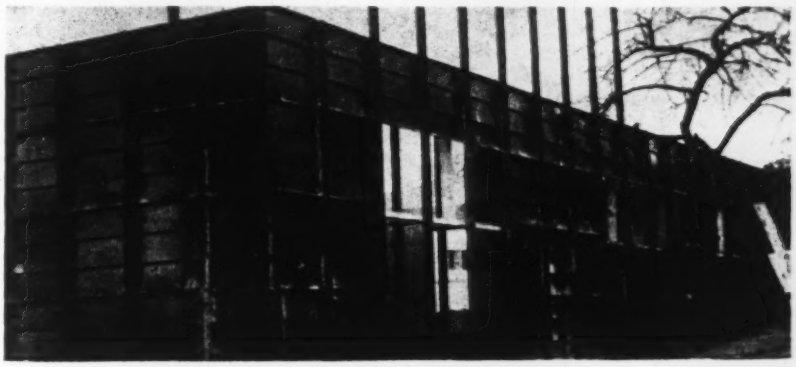
The preliminary organization work is under Capt. C. Ken Weidner, Civil Engineer Corps, U.S.N.R., former consulting engineer, Seattle, Wash. His headquarters are at Room 2804, Arlington Annex, Arlington, Va.

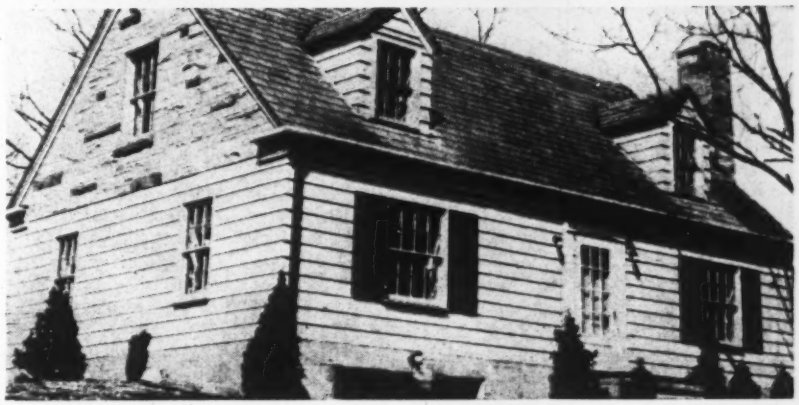
N. Y. Central R. R. plans Harlem River lift bridge

Replacement of the 50-yr. old swing bridge that carries main-line tracks of the New York Central and New York, New Haven & Hartford Railroad over the Harlem River at New York is planned by the New York Central. Its application for approval of a new bridge, which is to be a little to the west of the present crossing, is now before the district engineer, U. S. Army.

The proposed bridge will have twin vertical-lift spans furnishing a 225-ft. normal clear opening to the navigation channel in place of the two 103-ft. openings. It will have vertical clearance above high water of 135 ft. when open and 25.2 when closed.

Upon completion of the new bridge and relocation of the approach tracks, the old structure will be completely removed.





***Concrete Houses With Clapboard Appearance**—Standardized sectional steel forms, assembled and erected most readily with a truck crane, are being used to build 100 concrete houses at New Brunswick, N. J. Adaptable to buildings of different designs by utilization of section multiples, forms are made by the Irvington Form & Tank Corp. to produce an exterior wall with the appearance of clapboard siding. Slag concrete will be used in the walls and nailable concrete, resting on light steel channels, in the roofs. The method was developed by A. J. O'Brien, construction engineer, and the houses were designed by B. H. Whinston, architect of the Newcrete Housing Co., New York City.*

CONSTRUCTION IN CANADA

Quebec plans extensive rebuilding of highway bridges—Housing development planned at St. Johns—B. C. plans access roads

Quebec—Steel work is virtually completed on the new $1,000,000 plant of the White Motor Co. of Canada, Ltd. at Montreal, and the brick and concrete work has started. The plant was designed by Ross and Ross, architects and engineers, and is being erected by the general contracting firm of Angus Robertson Co. Ltd. of Montreal. J. E. Wilcox works manager and Harry Exley, building superintendent, are directing the construction and installation work for the company.

Plans are being made for the construction of several important bridges in the province and work will start soon. The most important will be built at Three Rivers, over the St. Maurice River to replace the present structure, which has been adjudged inadequate for present traffic needs. Their cost, which will be spread over two years, is placed at approximately $1,500,000. Another important bridge, at St. Cesaire, Rouville County, will cost about $150,000.* There are others to be built in the Eastern Townships and in the Gaspe peninsula, of an equal urgency.

Romeo Lorrain, minister of public works has announced that work will be started on a new court house and prison at Chicoutimi. The department is also undertaking repairs on a number of government structures in different parts of the province.

New Brunswick—Housing Enterprises, Ltd., of Toronto, Ont., a subsidiary of a group of Canadian life insurance companies, will build 106 houses in the suburbs of St. Johns. To be ready for occupancy next fall, the development will include 101 single-family houses and six semi-detached houses. All the buildings will be 90 percent frame construction, and 10 percent of brick veneer. The sponsoring company will handle the development for at least 50 years, during which the cost will be fully amortized. The rentals are to be based on the construction and maintenance costs, with ex-servicemen and their families given preference as renters.

British Columbia—Department of Public Works contracts on which construction is in progress, or on which bids have been called for, amount to $2,468,012, while plans call for spending a further $3,375,000. The work includes hospitals, schools, libraries, and a government office building in Victoria.

Construction of one of the finest motor roads in Canada is to be undertaken by this province to provide access directly into the city of Vancouver from the Trans-Canada and the Interstate highway systems of the United States. The new road will be established as a result of the government decision to resurface and widen Kingsway for a stretch of from 3½ to 4 miles. The work will involve expenditure of $750,000 and will establish a 4-lane speedway between Vancouver and New Westminster where connections will be made by means of the Pattullo Bridge with transcontinental highway systems. Between Vancouver and New Westminster the road will have four traffic lanes, each 11 ft. wide. Work will start as soon as possible.

Alberta—This province has voted $3,905,681 for road maintenance and for new main highways construction $3,362,840; for bridge construction; $200,000; for public buildings $219,898 and $1,664,250; and for district roads construction $440,000. Bids are to be called by the Department of Public Works sometime during June.

Ontario—Exactly 40 days after a $3,000,000 fire wrecked a large portion of the Alexandra Bridge over the Ottawa River between Ottawa, Ont. and Hull, Que., (*ENR* April 11, vol. p. 520) and laid waste 16,000 cords of pulp logs in the E. B. Eddy Co.'s Hull plant in a spectacular night blaze, a heavy CPR locomotive pulling six loaded freight cars and a caboose crept slowly over the bridge on May 8, the first train to make the crossing since the fire. The train was run over the bridge as a final proof of structural soundness, and passenger traffic was resumed that same day.

The Dominion—Hereafter all housing activities of the federal Canadian government are to be centralized under the control of C. D. Howe, Minister of Reconstruction and Supply, who is an engineer.

Charge misfeasance in Baltimore sewer contracts

Charging unlawful and negligent performance of lawful duties in connection with a $555,000 sewer contract award, a grand jury at Baltimore, Md., last week returned indictments against the three members of the Baltimore County Commission.

The charges grew out of investigations which the grand jury began on April 15 into a contract for construction of sewers in the county, awarded to the contracting firm of Gaines and Bautz, of Towson, Md., on an unbalanced original low bid of $352,450, which commissioners said was "considerably under" the next lowest bidder, who submitted a balanced bid. The contract proposal specifically stated that no plans then existed for the work and that exact location of the projects was not known at the time the contract was let (Oct. 2, 1944).

Bringing indictments against commission chairman Christian A. Kahl, and commissioners John R. Haut and Bremen A. Trail, the jury contended that the county had paid the Gaines and Bautz firm about $91,000 more than it would have had to pay the second bidder on his balanced tender. The jury, in eight specific charges, said the commissioners had let many jobs to the contractor "neglecting . . . to advertise publicly . . . and . . . permitting such work to be constructed . . . for substantial sums of money . . . contrary to" state laws.

Praeger, Loyd become Madigan-Hyland partners

Emil H. Praeger and Clinton F. Loyd, both with Madigan-Hyland, consulting engineers, Long Island City, N. Y., since 1934, have been admitted to partnership in the firm.

Mr. Praeger, who was formerly chief engineer of the organization, has recently returned after more than four years service with the Navy's Civil Engineering Corps, rising to the rank of captain.

Mr. Praeger has also been on the faculty of the Rensselaer Polytechnic Institute, Troy, N. Y. He is an R.P.I. graduate, class of 1915, and was named head of the department in 1939.

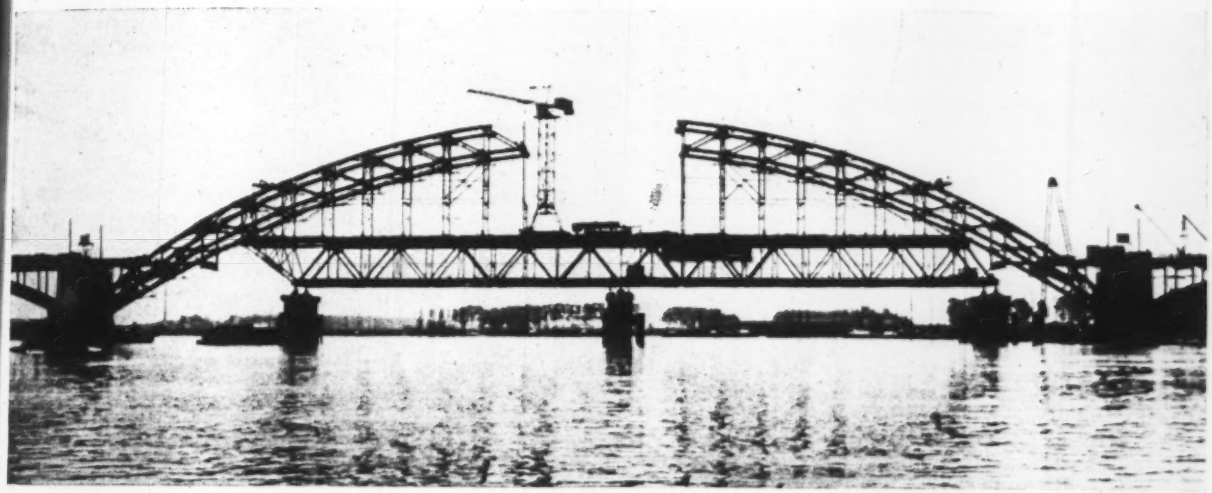
Mr. Loyd, a native of Minnesota, was graduated from the University of California's school of architecture in 1925. After two years with San Francisco architectural firms, he was appointed architect for the Westchester County (New York) Park Commission, and designed numerous structures during his seven years in that capacity.

Chester, Ill.—The Illinois-Missouri bridge spanning the Mississippi River at Chester, Ill., which collapsed July 29, 1944 during a tornado (*ENR* Aug. 3, 1944, vol. p. 125) will be ready for use by August 1, according to C. W. Scott, bridge superintendent. The steel work is complete now, and concrete work will be completed by July 1.

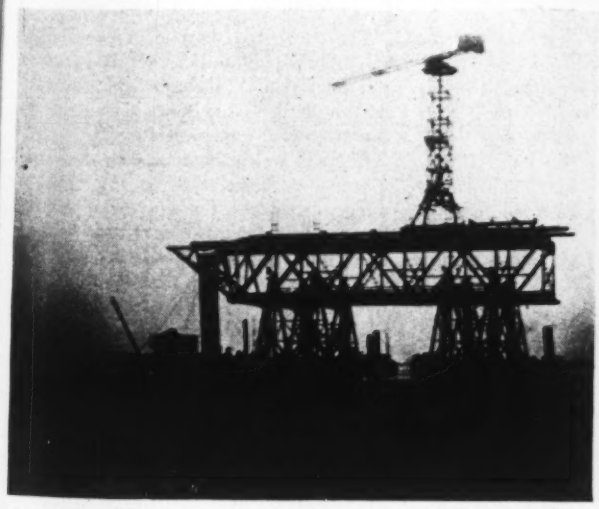
How the Famous Nijmegen Arch Was Built

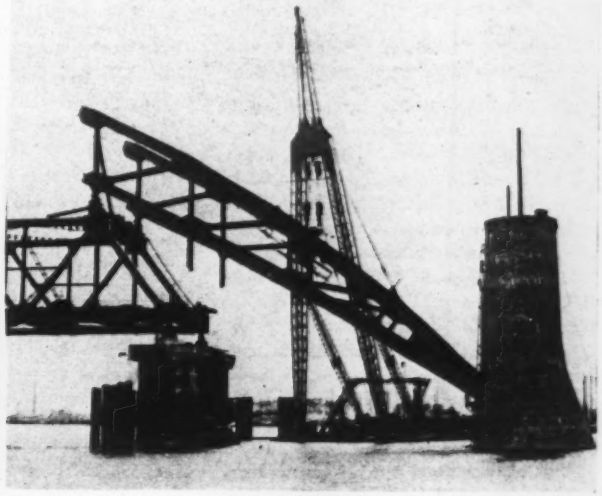
Many of Europe's already famous bridges gathered new fame during the war when some military operation focused the light of public attention on them. High honors in this respect probably went to the Rhine crossing at Remagen, Germany, but a close second was the bridge at Nijmegen over the Waal River, the name of the south arm of the Rhine in Holland. Here it was that the first great airborne army of British and Americans landed in an attempt to cut off the Germans along the Dutch coast and to establish a northern flank for the attack on Germany itself. And the capture, undamaged, of the modern 800-ft. two-hinged steel arch bridge at Nijmegen was first-page news the world over.

Pictures that have just come to hand, via D. B. Steinman, consulting engineer in New York, from the Dutch engineer A. Roggeveen, show that the erection of the Nijmegen arch in the late 1930's was attended by some unusual operations, particularly with respect to the centering. Briefly, a two-span continuous truss bridge destined for permanent use about a hundred miles downstream was drafted to do centering service. Floated into place on temporary piers on the alignment of the Nijmegen bridge, it carried a hammerhead crane to erect the arch steel, which was supported by the centering until the arch was swung free. The accompanying views tell the story of these unusual operations.



Continuous truss bridge, destined for permanent use elsewhere, serves as centering for erection of 800-ft. span arch. The temporary piers are of steel sheetpiling capped with concrete. They are spaced to provide two shipping channels 200 and 260 ft. wide. After the arch was completed the centering was moved 100 miles downstream to its permanent site.





Floating half of centering bridge into position. It was assembled on the barges near the shore and then jacked up on top of the high falsework before being moved to its temporary piers. The top of the hammerhead crane is 230 ft. above the water. Right: Floating derricks erected the heavy end sections of the arch trusses spanning between the abutment and the centering bridge.

Water use projects move to active stages as Congress provides money

Major developments in irrigation and navigation work elsewhere approaching construction stage as engineers approve plans

With the passage last week of appropriations authorizing a vast amount of public works construction (*ENR* May 16, vol. pp. 763, 765, 766) there is increased activity in the planning of flood control, power and irrigation projects in various sections of the country, and actual start of work on several of them is imminent. Some of the new developments follow:

Bids for a flood-control program for the Puyallup River in western Washington are being opened this week at Tacoma by Col. Conrad P. Hardy, Seattle District Army Engineer. Designed by Army Engineers to prevent recurring flood damages in the industrial area of Tacoma, the entire project will cost about $2,000,000.

The project will cover a 3-mile stretch of the river, starting near the eastern city limits and ending down-river at the 11th St. bridge. Work involves straightening of the river channel, construction of levees to retain flood waters within the channel and reconstruction of six bridges —including the northern Pacific Railway transfer bridge which will be rebuilt entirely at a new location.

Levees will be earth, protected on the river side with rock riprap revetment varying from 2½ ft. thickness at the bottom to 1½ ft. at the top. Varying in elevation from 26.2 ft. above mean lower low water at the upper end to 19½ ft. above low water at the lower end, levees will be 19 ft. wide with a maintenance road on the top.

Columbia Basin work

Six subdistricts have been formed to accelerate construction of the Columbia Basin irrigation project in eastern Washington, according to an announcement by H. A. Parker, irrigation engineer. Additional subdistricts will be created later by the Bureau of Reclamation under its schedule to provide irrigation water for 400,000 acres by 1950-51. (*ENR* May 16, vol. p. 783.)

Construction of The Dalles Dam project on the Columbia River in Oregon, including a dam and reservoir, navigation locks, power plant, fishways and other structures, has been recommended by the army engineers. Cost, with three initial power units, is estimated at $90,480,000, based on 1940 prices levels, and, with 12 of the ultimate 15 power units, at $131,629,000.

Early construction of McNary and Foster Creek dams on the Columbia river, Hungry Horse Dam in Montana, the Detroit Dam in the Willamette River basin, and two of the chain of dams proposed for the lower Snake River, was advocated at a recent meeting of the Bonneville Power Administration regional advisory council in Pendleton, Ore., to avert a serious power shortage and a sharp reduction in resource development.

A new field office of the Bureau of Reclamation was opened May 1 at Spanish Fork, Utah, where Rulon H. Sorenson will be in charge. Survey crews will use the office as an operational base when they investigate proposed reservoirs, tunnels and canal lines in Juab and Millard counties, with drill core operations for dam site surveys to begin around June 1 in Diamond Fork Canyon.

Utah's 41-mi. Salt Lake aqueduct (*ENR* Dec. 20, 1945, vol. p. 836) will cost around $2,000,000 more than was previously estimated, it was announced recently by Bureau of Reclamation officials, who said a revised contract has been prepared. According to the original 1938 contract, cost of the aqueduct was specified at $5,500,000. Current costs value the construction at about $7,500,000.

The bureau also announced establishment of a field office at Kemmerer, Wyo. in charge of Palmer B. DeLong. Field crews are now making surveys and land classifications on the Seedskadee unit of the Sublette project. This project includes all of the potential developments for irrigation within the basin above Green River, Wyo.

Foundation exploration work also will begin in early summer on the Kendall Dam site—Key Sublette project structure—high on the Green River, near its source.

A contract will be awarded shortly for the construction of the Fort Gibson Dam, Oklahoma, and work will be in full swing next month, according to Lieut. Gen. Raymond A. Wheeler, Chief of Engineers.

Contract for construction of the Clearwater Dam on the Black River, near Piedmont, Mo., was recently awarded to the Mitty Brothers Construction Co. of Los Angeles, on a bid of $3,415,000.

Eastern and Southern jobs

A flood protection project, which will cost an estimated $600,000, designed to prevent the periodic flooding of large areas of the villages of Lancaster and Depew, is expected to be under way shortly on Cayuga Creek.

Army engineers have recommended the construction of four flood control dams in the Yadkin River valley in North Carolina, estimated to cost $7,194,000. Two of the dams would be built on the Yadkin above Wilkesboro, and two would be built on Reddies River, a tributary, north and west of North Wilkesboro.

Contra Costa canal work approaching final stage

Construction of the final link of the 47.5-mile Contra Costa canal and Mountain View Dam and reservoir will begin shortly in the Central Valley project in California, according to Richard L. Boke, regional director of the Bureau of Reclamation at Sacramento. A $568,974 contract for the work was awarded recently to Parish Bros., Benicia, Calif.

One of the principal waterways of the Central Valley project, the canal will provide for ultimate irrigation of 22,000 acres, as well as furnishing industrial and domestic water supplies for cities in the San Francisco Bay area. Work to be done includes excavation, concrete lining, and structures for the last 3.6-mi. section, and construction of Mountain View Dam, on earth embankment about 50 ft. high and 1,200 ft. long to form an equalizing reservoir at the western terminus of the canal near Martinez. A 38-mi. section has been in operation since 1940.

Highway dept. can collect for bridge damage

The Georgia Court of Appeals has ruled that the State Highway Department can maintain a damage suit for the destruction of a bridge that is a part of the state highway system.

The suit was brought against the W. L. Florence Construction Co. for $39,266 alleged damages for the collapse of a bridge over Sweetwater Creek a half mile from Austell on the Bankhead Highway. It was alleged that the construction company placed a 50,000-lb. load on the bridge and allowed a boom to extend so high that it knocked down the bridge supports.

Judge J. H. Hawkins in Cobb Superior Court sustained a general demurrer to the action, but the Court of Appeals reversed him, holding that the highway department is responsible for replacing bridges that are destroyed and for this reason is legally empowered to maintain actions for their destruction.

Rio Grande and Interior Dept. get funds

The House has passed a bill (H.R. 6056) containing $9,250,000 for the International Boundary and Water Commission to begin the construction to be carried out by that agency in accordance with the treaty between the United States and Mexico for regulating and distributing the waters of the Rio Grande, Colorado, and Tijuana rivers.

The appropriation—if approved by the Senate—will permit start of a construction program to cost many times the amount contained in the present bill. The Mexican water treaty was signed Feb. 15, 1944, but did not go into effect until November of last year (*ENR* Nov. 15, 1945, vol. p. 643).

Some $8,000,000 of the money approved by the House is earmarked for starting construction of a storage dam on the Rio Grande between Laredo and Roma, Texas. The total cost of this project is estimated at $35,800,000, of which the U. S. will supply $22,700,000. Work to be started immediately at the damsite includes river diversion, stripping operations and cutoff trench excavation, and placing of 50,000 cu.yd. of concrete in the river spillway section.

One of three dams planned

The dam near Roma is one of the three main storage dams on the Rio Grande called for in the treaty. But the international commission is given discretion to increase or decrease the number of such storage reservoirs upon detailed study, provided the change is approved by the two governments. In addition to the Roma dam, a dam may be constructed in the section between Santa Helena Canyon and the mouth of the Pecos River, and another in the section between Eagle Pass, Tex., and Laredo.

It is to be noted that the Bureau of Reclamation is also going ahead with construction of Davis Dam on the Colorado River near Kingman, Ariz., in accordance with the treaty (*ENR* Feb. 7 vol. p. 171).

Of the remaining money provided for the commission's construction work, about $850,000 will be spent for flood control on the lower Rio Grande. Work on this project, which will eventually cost nearly $12,000,000, including approximately $2,400,000 yet to be spent, was largely suspended during the war. Considerable levee and floodway work remains to be done.

The commission is also supplied with between $100,000 and $200,000 for each of the six following projects: (1) Rio Grande rectification project in Texas; (2) Rio Grande bank protection in Texas; (3) Rio Grande canalization work in New Mexico; (4) continuation of a $400,000 sanitation project at Nogales, Ariz.; (5, construction of a long border fence along the Rio Grande in Texas, and (6) construction of several hundred miles of boundary fence in Arizona, New Mexico and California. About $15,000 of the money will also be used for preparation of detailed plans for construction.

The rectification project, authorized by a 1933 treaty, calls for shortening of the river between El Paso, Tex., and Quitman Canyon from 155 to 90 river miles. The bank protection project consists of the installation of revetments along bends in the river at critical locations in Hidalgo and Cameron counties, Texas.

The canalization project calls for the control of the river from Caballo dam in New Mexico to the international boundary at El Paso, a distance of about 100 miles.

The House has passed an appropriation bill (H.R. 6335) containing $107,345,530 for construction by the Department of the Interior. This is an increase of $4,302,000 over the amounts recommended by the House Appropriations Committee and listed in detail in *Engineering News-Record* May 16, vol. p. 765.

Although the House committee had reduced the construction and engineering money in the bill by more than 50 percent, the House as a whole saw fit to increase the money for construction by only $4,302,000.

'Vertical' sewer system may be abolished

On account of amended state laws and a ruling of the Ohio Water Resources Board, the city of Bellevue may be forced to discard its nearly century-old vertical "sewer system" and replace it with a modern sewer network and disposal plant, announced F. H. Waring, chief engineer for the Ohio Health Department.

Ever since it was founded, Bellevue has relied on a unique underlying rock formation to dispose of its sewage. Residents use an estimated 1,500 sink holes, through the solid surface rock strata, which reach partly hollow, often water-filled, limestone formations below.

Under rules adopted by the Ohio Water Resources Board last December, the use of any well for disposal of sewage "or other material considered deleterious to the potable underground water" is prohibited, and apparently the state authorities believe there is at least a potential menace.

New power fields opened by low interest rates

Many water power sites that could not have been developed economically by private capital a decade or so ago, now offer possibilities for such development due to a sharp decline in interest rates and to changes in federal policy toward river development, according to L. F. Harza, consulting engineer, Chicago.

Speaking before a joint meeting of the Chicago Engineers Club and the engineering history division of the Western Society of Engineers, on May 9, Mr. Harza said that money rates have been driven down to such a low level as to reduce greatly the annual fixed charges, which constitute such a large proportion of the cost of hydro-electric energy, thus making many water-power projects feasible and sound economically that would not have been sound under previous rates of return on investment.

Other factors contributing to this revolutionary change were listed by Mr. Harza as being the Supreme Court's ruling in the TVA case that power is a by-product of navigation and flood control in the development of the navigable rivers of the country, and so should bear only part of the cost of facilities used jointly for power, navigation and flood control, and that court's extension of federal jurisdiction over practically the entire length of all the major rivers of the country rather than just to the navigable portions of those rivers. This brings a great many more projects under federal control, and as navigation and flood control are considered to be of paramount public interest, a share of the cost formerly charged to power is absorbed by these beneficial uses, leaving less cost to be charged to power.

Industries follow power

The government, said Mr. Harza, is able to install generating capacity far ahead of what corporate interests would dare to install without visible markets. Citing the TVA and the Bonneville projects as examples, he said, "The original theory in 1933 was to create work, backed by the hope that cheap power would attract industries at some future time; in other words, that the industries would follow the power. The above influences actually did make the power cheap and did attract industries. Finally, helped and stimulated by the war, the demand for power became intense. And the end is not yet. The demand for large blocks of power still continues and is giving impetus to consideration of still more developments. Thus a source is now sought for 500,000 kw. for one single research experiment."

MEN AND JOBS

Herbert T. McNeely, city engineer and superintendent of the water department of Iron Mountain, Mich., since 1942, has resigned to become secretary-treasurer of the newly organized Straits Construction Co. at St. Ignace, Mich. **Mario J. Calcaterra** is president and **Conrad Denison** is vice-president of the new firm.

Werter S. Hackworth, who entered railway service as a track laborer on the Nashville, Chattanooga & St. Louis in 1916 has been elected president of that railway. He was graduated from Alabama Polytechnic Institute with a civil engineering degree just before he started work with the railway.

J. P. Cousineau, a graduate of Polytechnical College, Montreal, Que., has been named town engineer of Val d'Or, Que.

Ed. N. Jenkins has been appointed county engineer for Jefferson County, Ark., at Pine Bluff. He was assistant state highway engineer in the eastern district several years and once was district engineer for the Cotton Belt Railway. More recently he has been associated with the Smaller War Plants Corporation in Little Rock.

Lt. Col. G. L. Cook, retiring executive officer; Col. Thomas F. Kern, district engineer, and Maj. J. I. Gurfein, new executive officer, are heads of the Providence, R. I., engineer district, overseeing vast flood-control programs in five New England States. Colonel Cook, previously a civilian employee of the office since 1910, is scheduled to go on the inactive list shortly. Major Gurfein recently completed combat duty in the European Theater. Colonel Kern has been head of the district for the past year.

"The Price is - - - " Col. Mark M. Boatner, Jr., district engineer, Mobile, Ala., reads bid prices at recent opening of tenders on Allatoona Dam, which will be thrown across Georgia's Etowah River near Cartersville. At right is R. W. Stuck, chief engineer, South Atlantic Division, Atlanta. National Constructors Inc., Columbus, Ga., received the contract.

Harry M. Bolton of Geneva, N. Y., has been appointed city engineer as successor to **J. W. Brennan,** who served for more than 40 years. His duties include supervision of highways and superintending the water department.

Mayer A. Griswold, Urbana, Ohio, Champaign County highway engineer since 1940, is resigning to become sales engineer for the W. W. Williams Co., Columbus.

J. D. Lewis, chief engineer for the State Highway Department, southern district, Hattiesburg, Miss., has resigned, and is succeeded by **J. W. Kornrumpf,** World War II veteran, formerly office engineer and with the department 14 years.

John F. Laboon has resigned as director of the Allegheny County, Pa., works department to devote his full time to the chairmanship of the county sanitary authority. The county commissioners have appointed **Levi Bird Duff** to succeed Mr. Laboon in the directorship of public works.

G. Millard Parks, assistant city engineer of Anaheim, Calif., has resigned to become planning engineer for the city of Santa Ana.

City Engineer **Louis H. Goss** of Brawley, Calif., has resigned to become city administrator of Monterey Park.

John P. Powers, city engineer of Little Rock, Ark., has resigned to take effect when a successor can be obtained. He plans to go into private practice.

Raymond J. Wilson, city engineer of Concord, Fla., has resigned to become senior party chief of the locating department of the state highway and public works commission.

Col. William J. Walsh, has been appointed Locality Housing Expediter for New York City for the National Housing Agency, it has been announced by Charles S. Ascher, Regional Housing Expediter. Colonel Walsh served with the Anti-aircraft Artillery, and was a member of the War Department Manpower Board.

O. P. Jordhein, building inspector and assistant city engineer at Fargo, N. D., has resigned after having been with the city engineering department for 23 years. He is joining the George F. Haggart Construction Co. of Fargo.

E. Montford Fucik, formerly foundation engineer, Third Locks Project, The Panama Canal, and lieutenant, Civil Engineer Corps, U. S. Naval Reserve, has joined the Harza Engineering Co., constructing engineers, Chicago, Ill.

T. Glenn Hall, former assistant city planner of San Francisco, Calif., has become planning engineer for Sacramento to succeed the late Edward E. Welch. He has spent 25 years in landscape architecture, city planning, park engineering, architecture and civil engineering.

F. E. Peterson, city engineer, De Kalb, Ill., for the last 16 years, has resigned to become city engineer and sanitary district chief at Belvidere, Ill.

John D. Hall has been appointed general superintendent and chief engineer of the water department of Batavia, N. Y., having supervision of filtration, laboratory, maintenance and operation, meter department, personnel and office.

Col. Claude H. Chorpening, district engineer of the St. Paul, Minn. district has been transferred to Tulsa, Okla., as district engineer.

Clarence W. Klassen, chief of the Illinois Division of Sanitary Engineering, under the Illinois Department of Public Health, has been re-appointed the Illinois member of the Ohio River Valley Sanitation Compact Commission. He resigned the post to enter the armed forces.

Back to Civilian Activity

C. P. Conrad, past commodore in the Navy and a hydraulic engineer, has been elected president of the Iowa, Illinois Gas & Electric Co., Rock Island.

Richard C. Dwyer with the armed services for 3½ years, has been appointed chief engineer of the department.

J. A. Clulo of Norway, Mich., lieut. comdr., CEC, USNR, is superintendent of public works and city engineer of Marquette, Mich. He served with the Seabees in the Pacific.

After more than five years of military service, **Capt. Jewel Winn Ewing,** Corps of Engineers, is now with the State Road Department at Deland, Fla.

George D. Baird, commander, CEC, USNR, has been released to inactive duty. Recently he has been assistant public works officer for the Jacksonville, Fla., naval air station. He will return as civil engineer with the Army Engineers.

Jacob Wegweiser, lieutenant, recently released from the Civil Engineers Corps, U. S. Navy, is now with the Underpinning and Foundation Co., Inc., New York City.

Joseph W. Pahl and **James Gipe,** of Great Falls, Mont., veterans, have joined the engineering firm of Corwin & Co., consulting engineers and architects, of that city.

William A. Moggio, major, has been appointed field engineer in the southern and south central region for the National Council for Stream Improvement of the pulp, paper and paperboard industries. He is a sanitary engineer specializing in industrial waste treatment.

J. C. Herron, major, 1126th Combat Engineers, and formerly with the Portland district U. S. Army Engineers, has joined the Iron Fireman Manufacturing Co., Portland, Ore.

William M. Goldston, colonel, who was in command of the 26th Regulating Station in Germany, has returned and formed the partnership of Middleton and Goldston, Corpus Christi, Tex., with **G. C. Middleton.** Both men were formerly with the Austin Bridge Co., Dallas, Tex.

H. L. Frapwell, lieut. colonel, after 4½ years as post engineer in various camps in New Jersey and New York, is with the General Electric Co., New York City.

Fred K. Wooley, major, corps of Engineers, has been appointed engineer-manager for the Orange Cove Irrigation District, Calif.

Marcus Mattison, lieut. commander, CEC, has formed a construction firm with **Walter E. Bonds** at Minneapolis, Minn.

Arthur P. Sprogis, major C. E., formerly chief of section of the general construction section of the ASFTC Engineer Training Branch at Fort Leonard Wood, Mo., has returned to civilian status, with the Federal Public Housing Authority, Boston, Mass., office, as project engineer.

Orson A. Israelson, Logan, Utah, former pilot in the Eighth Air Force, has been appointed assistant engineer for the Oregon State Board of Aeronautics.

Structural Engineer **Donald F. Shugart,** colonel, has returned after five years in the Army Air Corps, and has opened an office in Beverly Hills, Calif.

James L. Calhoun, Elmhurst, has returned recently from military leave to district 1, Elgin, Illinois Division of Highways, as civil engineer.

Frank B. Sebastian, Elgin, has returned to the Illinois Division of Highways as civil engineer, district 1.

Harold B. Gegel, Marissa, has returned to district 8, East St. Louis, Illinois Division of Highways, as civil engineer, after military leave.

Fred Merryfield, Holly Cornell, James C. Howland, and **Thomas B. Hayes,** all veterans, have formed the consulting engineering firm of Cornell, Howland, Hayes & Merryfield.

New Officers of The Moles—Alfred N. Warwick, center, New York building contractor, has been elected president of The Moles, New York organization of tunnel and heavy construction men. He is president of Eugene F. Warwick, Inc., which for many years has specialized in industrial building construction and is at present completing the Boulevard Hospital in Astoria, L. I. Mr. Warwick succeeds Arthur A. Johnson. Other officers elected at the annual meeting May 1, are: left to right, William W. Hanly, Jr., Koppers Co., secretary; J. Rich Steers, Jr., J. Rich Steers, Inc., second vice-president; Warwick; Charles B. Spencer, of Spencer, White & Prentis, first vice-president; and Ralph W. Atwater, Shultz Dredging Co., treas.

ENGINEERING SCHOOL NEWS

J. K. Finch, new engineering dean at Columbia—Illinois to have a summer camp—Traffic engineering fellowships at Yale.

James Kip Finch, professor of civil engineering, has been named dean of the School of Engineering at Columbia University, succeeding Joseph W. Barker, dean since 1931, who resigned to become president of the Research Corp. Dean Barker officially will be on leave of absence until June 30. Dean Finch assumed direction of the school as of April 1.

Dean Finch, who was graduated from Columbia in 1906 with the degree of civil engineer, served as acting dean of the school from March, 1941, until the beginning of this academic year, while Dean Barker was in Washington as special assistant to the Secretary of the Navy, in charge of the Navy's educational and training programs.

"The Southern Engineer," official publication of the North Carolina State College Engineering School, has resumed publication after having been suspended for more than two years during the war. Maurice Dunn, of Charlotte, N. C., is the editor.

At the University of Minnesota a 5-year technology curriculum, including liberal arts courses, will be put into effect next fall for non-veteran freshmen. Social and biological sciences and the humanities courses now will be included, with a 45-credit maximum and nine hours of electives available.

Northwestern University, Evanston, Ill., is planning a new program of engineering courses, according to Prof. Paul E. Clopstey, director of research in the Northwestern Technological Institute. The work of training graduate engineering students was practically suspended during the war. The new program to train 200 graduate students and 1,000 undergraduates, began April 1. There is a total enrollment of 1,200 engineering students in the comparatively new Northwestern Technological Institute.

The civil engineering department, University of Illinois, will open its summer surveying camp July 15 at Camp Rabideau in the Chippawa National Forest, near Bemidji, Minn., to continue till Sept. 7. It will be a sophomore course and it is expected that 60 students will be in residence. Prof. W. H. Rayner, of the department, will be director. Prof. C. C. Wiley will be in charge of the camp. Prof. G. H. Dell, also, will teach. Likewise on the teaching staff will be John S. Dodds, professor of civil engineering, Iowa State College, Ames, Iowa, who has been director of the Iowa state camp, about 25 miles east of the Illinois camp, but which will not be held this summer.

Ten graduate fellowships in traffic engineering are announced by the Bureau of Highway Traffic of Yale University. They amount to $1,440 each and provide for a full academic year of graduate study beginning Sept. 23. They have been made possible by a grant from the Automotive Safety Foundation. The course provides a broad foundation in the techniques of highway traffic operation and is designed to give the student a thorough knowledge of traffic engineering.

Theodore M. Matson, director of the bureau says: "There is an increasing need for professional traffic engineers in highway traffic work in view of the acute street and highway transportation problems which now exist in nearly every community and which show signs of growing worse before relief can be obtained."

Awards are open to men who have an engineering degree from an accredited college. "In addition to those who are successful in the fellowship awards, the course is open to qualified veterans under provisions of the G.I. Bill of Rights. It is also expected that there will be students from city or state highway departments who will enroll either on their own or with some financial support through special assignment by their employers.

The closing date for applying for fellowships is June 1. Additional information may be obtained from the Bureau of Highway Traffic, Yale University, New Haven 11, Conn.

Women studying engineering at the University of Texas averaged better grades than male civilians, according to reports for the last winter semester. Six of 50 women students earned scholastic honors, along with 121 of the 2,383 male students. Sixty-nine of the honor students were war veterans. Naval trainees on the honor roll totaled 133. Clinton B. Cook of Moneta, Calif., was the highest ranking civilian student in the college.

Among the returning faculty members at the University of Wisconsin's school of engineering are: Lloyd F. Rader, professor of civil engineering, who was with the Navy as a commander and served as logistics officer in the office of the director of the Pacific Division of the Bureau of Yards and Docks; Lewis H. Kessler, professor of sanitary engineering, who served in the Army's utility section as a hydraulic and sanitary engineer; Eldon C. Wagner, assistant professor of civil engineering, who was a major with the topographic engineers in the European theater.

W. G. Huntington, head of the civil engineering department, University of Illinois, has named as assistant professor Milton O. Schmidt, Kenosha, Wis. who received a bachelor of science degree, 1938, and a master of science degree, 1941, from the University of Wisconsin. He has served as instructor at Kansas State College, as junior hydraulic engineer with the water resources branch, U. S. Geological Survey, and he has been with the Public Works Administration. From 1941 to 1944 he was on the faculty at Carnegie Institute of Technology, head of instruction in surveying highway engineering and summer surveying camp. For two years, he served as lieutenant in the USNR and was a naval hydrographic survey officer. Professor Schmidt has assumed his duties and is concentrating upon surveying highways and hydraulic engineering subjects.

Benjamin K. Hough, Brookline, Mass., has been appointed assistant to the dean of engineering, Cornell University. He received his bachelor's and master's degrees at Massachusetts Institute of Technology, and from 1936-1941 was a member of the instruction staff at Cornell. He entered the armed services in 1942 as captain, Engineers Corps, U.S.A., and was assigned to the Manhattan Project. He later served 20 months in the China-India-Burma area as construction staff officer with the rank of lieutenant-colonel.

With engineering the most popular course among new students—80 per cent of them veterans—at Gonzaga University, Spokane, Wash., plans are being rushed for construction of a new engineering building.

E. R. Wilcox has cut short a leave of absence, during which he taught at an Army school in England, to resume his duties at the University of Washington, Seattle, as professor in general engineering and executive officer of the department of general engineering.

The College of Engineering at the University of California, Los Angeles, has received a gift of $15,000 from the Deutsch Engineering Co., it is announced by Dean L. M. K. Boelter. The fund is to be used on projects carried out by graduate students.

David L. Mills cited for work on "Hough Team"

David L. Mills recently received the bronze star, together with a Presidential citation, for his work as a civilian consultant to the commanding officer during the operation of the "Hough Team" in Germany. He is the second civilian employee of the Corps of Engineers to be so honored, the other bronze star having gone to Gail A. Hathaway, special assistant to the Chief of Engineers.

Mr. Mills, who is now serving as civilian assistant to the chief of the Geodetic Division, Army Map Service, served as expert civilian consultant with Maj. Floyd W. Hough, commanding the "Hough Team" mission in the European theater from October 25, 1944, to May 8, 1945. During a portion of this time, Mr. Mills served as a civilian in the combat areas of the Rhineland and Germany campaigns, with the commanding officer of the mission. Much of the time he carried on his work within mortar fire range of the enemy.

Mr. Mills' most notable contribution was the procurement of much needed German geodetic coordinates, not previously available, for the provinces of Baden, Wurttemberg and Bavaria, in time to be of immediate operational use to the artillery of the 3rd and 7th Armies.

Federal-aid funds held not "cash in hand"

The attorney general of Oklahoma has ended hopes of the state highway commission that it could use the assurance of federal aid road funds in the sense of "actual cash-on-hand" under the state's new budget balancing amendment, to permit the contracting of a greater number of highway projects.

Attorney General Mac Q. Williamson ruled that, although it may be a certainty that the federal funds will be forthcoming, the highway commission may not encumber the money until it is actually received.

Williamson held that federal contributions, or allocations are "not cash-on-hand" in the conventional sense until the money is actually received. Oklahoma highway officials declined to comment on the possible effect of the ruling until they have thoroughly studied it. Indications are, however, that they will apply to the U. S. Public Roads Administration for an advance against its promised federal aid allocations so the state of Oklahoma will have more actual cash on hand to permit the setting up and letting of additional road projects.

San Francisco awards first airport contract

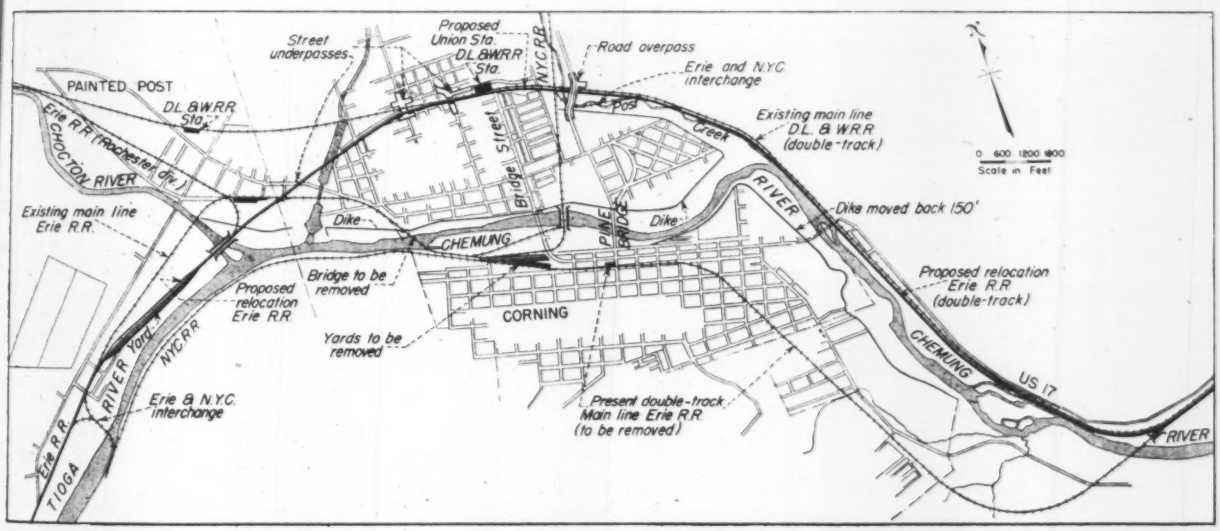
The first contract since passage of a $20,000,000 bond issue for improvement of San Francisco's municipal airport (*ENR*, Nov. 22, 1945, vol. p. 693) was awarded early this month by the city's Public Utilities Commission.

A low bid of $4,107,731, submitted on a joint venture basis by the Macco Construction Co. and the Morrison-Knudsen Co., received the award. Engineers' estimate for the work was $4,200,000.

The contract calls for a 6,000,000 cu. yd. fill in what is now about 350 acres of tideland. Paving of taxi strips is also included, as well as some mud excavation.

The work will allow for the construction of a new 8,000-ft. runway to run 90 deg. from one now in use. Specifications will be ready for bidding on the forthcoming runway work by the time the fill is completed.

Award of the contract was held up several weeks by a difference in overtime rates as set forth in a city ordinance and existing agreements between unions and the local AGC chapter (*ENR*, April 25, p. 3). The city ruling, calling for double time after 40 hours, was finally allowed to stand on the job, in spite of AGC protests that their time-and-a-half scale should prevail.



***Railroad Moves Out of Town**—The double-track main line of the Erie Railroad, cutting through the business district of Corning, N. Y., will be relocated in the city's outskirts for a distance of 6.92 mi. Seventeen highway crossings will be eliminated, since two new underpasses and one overpass will accommodate all street traffic at the new track location. Plans include a union station for the Erie and the Delaware, Lackawanna and Western R. R. A new 9-track Erie freight yard outside city limits will eliminate the present business sector yard. Erie trains will continue to run on existing tracks while the new line is being built, then both Erie and D., L. & W. trains will run on new tracks until crossing elimination structures are finished. A. Burton Cohen, New York consultant, has been commissioned by the State Department of Public Works to prepare plans for separation structures, which will cost about $2,500,000 of the $5,112,000 estimated total cost (at 1941 prices). The state will pay 85 percent.*

OBITUARY

William H. Bradley, 68, a former Mississippi state highway engineer, and formerly Madison County engineer, died at Memphis, Tenn., May 7.

John R. Putnam, 55, structural engineer for Stone & Webster Engineering Corp., Boston, Mass., died at Milton, Mass., recently. A graduate of Lowell Institute, Boston, Mr. Putnam had been associated with Stone & Webster for 35 years.

Leroy M. Milner, 56, civil engineer for the U. S. Engineers at West Memphis, Ark., died May 7.

James L. Morse, 62, engineer in the Bureau of Reclamation branch of design and construction at Denver, Colo., died May 5. A member of the family which included Samuel F. B. Morse, inventor of the telegraph, he was a captain in the Army Engineers in the first world war. He had been with the bureau for ten years.

Fred Emerson Smith, 56, general manager of the Harris Clay Co. at Spruce Pine, N. C., died recently. He had been engaged in construction in Tennessee, Kentucky, Georgia and North Carolina for a number of years.

J. H. Sundmaker, 76, who was director of public service in Cincinnati, Ohio, from 1909 to 1911, and who had also served in the highway department, died May 5. A notable project in his long career as an engineer was the construction of the Big Miami River bridge at Elizabethtown, Ohio.

William MacGlashan, a pioneer in the plaster-board industry in the United States, founder and president of the old Beaver Board Co. of Buffalo, N. Y., died May 6 at Glendale, Calif. He conceived the idea of a wall board in 1909 and formed the Beaver Board Co. In the early 1920s, Mr. MacGlashan and his company substituted gypsum for plaster board, and later the Beaver Board Co. was sold to Certain-Teed Products Corp.

Vere Buckingham Edwards, 56, for 22 years president of Dravo Corp., Neville Island, Pa., died May 8. He was graduated from Lehigh University in 1912, joined Dravo Corp. immediately, and became active in the firm's engineering work of building tugboats, barges, dredges, cranes, ore bridges, coal unloaders and gravel plants. In 10 years Mr. Edwards was vice-president, and 12 years later, when F. R. Dravo died, he became president.

Leonard Dozier, senior engineer in the U. S. Engineers office in Savannah, Ga., died May 10.

John Gremelsbacher, 70, for 33 years connected with the waterworks department of Sandusky, Ohio, and formerly superintendent of the distribution department, died May 10.

Ralph N. Priest, 63, for 40 years a civil engineer in Philadelphia, Pa., died at Norristown, Pa., May 14.

L. W. Baldwin dies: began as an engineer

Lewis W. Baldwin, 71, president of the Missouri Pacific Lines since 1923, died at St. Louis May 14. Mr. Baldwin was graduated from Lehigh University in 1896 as a civil engineer and began his railroad career that same year as a rodman on the Illinois Central R. R. Successively he rose to be an assistant engineer (1898), supervisor of track (1900), roadmaster, Memphis (1901).

In 1904 Mr. Baldwin went into the operating department as a trainmaster, being advanced to superintendent on the Yazoo & Mississippi at Greenville, Miss. in 1908, but returned to the engineering department in 1910 to be engineer maintenance-of-way for the Illinois Central system at Chicago. Three years later he returned to the operating department but continued his active interest in engineering through active participation in the work of the American Railway Engineering Association. In 1913 he served as president of that association.

During World War I, Mr. Baldwin served as a regional director for the U. S. Railroad Administration, and again in the recent war, he was placed in charge of the railroad of the Southwest during the brief period of Army control.

Expect record traffic on Mississippi River

Traffic on the Mississippi River is expanding and may set a record in 1946, according to Lt. Col. J. A. Adams, deputy district engineer of the St. Louis Engineer district. Army Engineers of the Rock Island district were quoted by the Associated Press as foreseeing a 1946 river tonnage total soaring topping 3,000,000, which would eclipse the present record of 2,606,482 tons hauled in 1941.

CONSTRUCTION ACTIVITY

As Reported this week to ... *Engineering News-Record*

CONTRACT VOLUME

Continental U. S. Only (Thousands of Dollars)

	Week of May 23 1946	Cumulative 1946 (21 wks.)	Cumulative 1945 (21 wks.)
Federal	$6,909	$243,355	$387,145
State & Mun.	26,021	461,369	91,111
Total Public	$32,930	$704,724	$478,256
Total Private	71,233	1,300,138	185,881
U. S. Total	$104,163	$2,004,862	$664,137

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Thousands)

Type of Work	This Week	Cumulative 1946 (21 wks.)	Cumulative 1945 (21 wks.)
Waterworks	$1,509	$40,863	$16,885
Sewerage	1,757	25,937	11,901
Bridges	1,541	46,315	10,494
Highways	13,691	260,583	63,672
Earthwork, Waterways	2,691	147,858	14,254
Buildings, Public	7,786	117,420	271,724
Industrial	23,737	403,445	127,561
Commercial	45,919	818,839	34,622
Unclassified	5,532	143,602	113,024

NOTE: Minimum size projects included are: Waterworks and waterway projects, $22,500; other public works, $40,000; industrial buildings, $55,000; other buildings, $205,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1946 (21 wks.)	Cumulative 1945 (21 wks.)
NON-FEDERAL	$382,760	$247,770
Corporate Securities	156,772	72,733
State and Municipal	225,988	154,137
RFC Loans	.....	20,900
FEDERAL	158,320	251,010
Total Capital	$541,080	$498,780

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	May'46	339.69	163.29
Building Cost	May'46	257.25	139.06
Volume	Apr.'46	340	149